

**Building Code of Australia
Deemed-to-Satisfy Section J Compliance Report
DoEAMD-16-14
Smalls Road, Ryde Public School**

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For: NSW Government Department of Education

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1.0 Introduction BCA 2016 Amendment 1

Part J Energy Efficiency Requirements

1.1 JO1 – Objective

The *objective* of this section is to reduce greenhouse gas emissions.

1.2 JP1 - PERFORMANCE REQUIREMENTS

A building, including its *services*, must have, to the degree necessary, features that facilitate the efficient use of energy appropriate to –

- (i) the function and use of the building and *services*; and
- (ii) the internal environment; and
- (iii) the geographic location of the building; and
- (iv) the effects of nearby permanent features such as topography, structures and buildings; and
- (v) solar radiation being –
 - (i) utilised for heating; and
 - (ii) controlled to minimise energy for cooling; and
- (vi) the sealing of the building *envelope* against air leaking; and
- (vii) the utilisation of air movement to assist heating and cooling; and
- (viii) the energy source of the *services*.

1.3 JP2 - LEFT BLANK

1.4 JP3 - PERFORMANCE REQUIREMENTS

Heating such as for a conditioned space must, to the degree necessary, obtain energy from –

- (a) A source that has a greenhouse gas intensity that does not exceed 100g CO₂-e/MJ of thermal energy load; or
- (b) An on-site renewable energy source; or
- (c) Another process as reclaimed energy.

2.0 Compliance Summary and Project Details

2.1 BCA PART J0 ENERGY EFFICIENCY

Where a building solution is proposed to comply with the Deemed-to-Satisfy Provisions, Performance Requirements JP1 and JP3 are satisfied by complying with –

- Part J0 Energy Efficiency
 - J0.1 Application of Section J
 - J0.2 Heating and cooling loads of sole-occupancy units
 - J0.3 Ceiling Fans
- Part J1 Building Fabric
 - J1.1 Application of Part
 - J1.2 Thermal Construction – General
 - J1.3 Roof and Ceiling Construction
 - J1.4 Roof Lights
 - J1.5 Walls
 - J1.6 Floors
- Part J2 Glazing
 - J2.1 Application of Part
 - J2.4 Glazing
 - J2.5 Shading
- Part J3 Building Sealing
 - J3.1 Application of Part
 - J3.2 Chimneys and Flues
 - J3.3 Roof Lights
 - J3.4 Windows and Doors
 - J3.5 Exhaust Fans
 - J3.6 Construction of Roof, Walls and Floor
 - J3.7 Evaporative coolers
- Part J5 Air Conditioning and Ventilation Systems
 - J5.1 Application of Part
 - J5.2 Air Conditioning Systems
 - J5.3 Mechanical Ventilation Systems
 - J5.4 Miscellaneous Exhaust Systems
- Part J6 Artificial Lighting and Power
 - J6.1 Application of Part
 - J6.2 Artificial Lighting
 - J6.3 Interior Artificial Lighting and Power
 - J6.4 Interior Decorative and Display Lighting
 - J6.5 Artificial Lighting around the Perimeter
 - J6.6 Boiling Water and Chilled Water Systems
- Part J7 Swimming Pool and Spa Pool Plant
 - J7.2 Heated Water Supply
 - J7.3 swimming Pool Heating and Pumping
 - J7.4 Spa Pool Heating and Pumping
- Part J8 Facilities for Energy Monitoring
 - J8.1 Application of Part
 - J8.2 Access for Maintenance
 - J8.3 Facilities for Energy Monitoring

This report will be assessing this building in relation to the compliance of these spaces with the list above as applicable to the project.

2.2 Project Details

The new Public School at Smalls Rd, Ryde is a landmark education project for both the NSW Department of Education and the Ryde community. The project will deliver accommodation for up to 1000 students on the site of the former Ryde High School. As a new school, this project represents a rare opportunity to deliver an integrated, future-focused learning environment for students and the design has been informed by 21st century education principles.

TABLE A2.1 SITE DETAILS

Site Location	12 Smalls Road, Ryde NSW 2112
	Lot1 DP797483
	Lot1 DP797484
	Lot8 DP821649
Client	NSW Government. Department of Education
Architect	Conrad Gargett
Certifier	Blackett Maguire + Goldsmith
Electrical Consultant	Wood and Grieve Engineers
Mechanical Consultant	Wood and Grieve Engineers
Hydraulic Consultant	Wood and Grieve Engineers
Fire Consultant	Wood and Grieve Engineers

TABLE A2.2 BUILDING DETAIL

Building Use	School Office and School Assembly, Consists of three storeys with the Ground Floor housing staff offices, staff rooms and amenities, library, community hall, canteen, OOSH facilities, sports and PE Store and external on-grade carpark, Level 1 and 2 feature student classrooms (homebases), library, COLAs and covered walkways
Building Class	Class 5 and Class 9b
Building Floor Area, m ²	
Retail Floor Area, m ²	N/A
BCA Climate Zone	5
BCA Edition	2016

3.0 Deemed-to-Satisfy Report Details: Part J0 Building Fabric

3.1 PART J0.1 - APPLICATION OF SECTION J

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a Class 2 to 9 building

Performance Requirements JP1 and JP3 are satisfied by complying with –

- (a) for reducing the heating or cooling loads—
 - (i) of sole-occupancy units of a Class 2 building or a Class 4 part of a building, J0.2 and J0.3; and
 - (ii) of a Class 2 to 9 building, other than the sole-occupancy units of a Class 2 building or a Class 4 part of a building, Parts J1, J2 and J3; and
- (b) for air-conditioning and ventilation, Part J5; and
- (c) for artificial lighting and power, Part J6; and
- (d) for heated water supply and swimming pool and spa pool plant, Part J7; and
- (e) for facilities for monitoring, Part J8.

Compliance:

- (a) (i) Not Applicable
 - (ii) Refer to Electrical Consultant documentation
- (b) Refer to Mechanical Consultant documentation
- (c) Refer to Electrical Consultant documentation
- (d) Refer to Hydraulic Consultant documentation
- (e) Refer to Electrical Consultant documentation

3.2 PART J0.2 - HEATING AND COOLING LOADS OF SOLE-OCCUPANCY UNITS OF A CLASS 2 BUILDING OR A CLASS 4 PART

Compliance Not Applicable

3.3 PART J0.3 - CEILING FANS

Ceiling fans required as part of compliance with J0.2(a), must—

- (a) be permanently installed; and
- (b) have a speed controller; and
- (c) serve the whole room, with the floor area that a single fan serves not exceeding—
 - (i) 15 m² if it has a blade rotation diameter of not less than 900 mm; and
 - (ii) 25 m² if it has a blade rotation diameter of not less than 1200 mm.

Compliance:

- (a) Refer to Electrical Consultant documentation
- (b) Refer to Electrical Consultant documentation
- (c) . Refer to Electrical Consultant documentation

4.0 Deemed-to-Satisfy Report Details: Part J1 Building Fabric

4.1 PART J1.2 - THERMAL CONSTRUCTION - GENERAL

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a Class 2 to 9 building.

Compliance:

The following requirements of all insulation set out in J1.2 have been included in the specification of this project to ensure the energy efficiency of this building.

- Insulation will comply with AS/NZS 4859.1
- Insulation will be installed so that it abuts or overlaps adjoining insulation.
- Insulation will be installed so that it forms a continuous barrier with ceilings, walls, bulkheads, floors or like that inherently contribute to the thermal barrier.
- Insulation will be installed so that does not affect the safe or effective operation of a service or fitting.
- Insulation will be installed with necessary airspace to achieve the required R-Value between reflective side of the reflective insulation and a building lining or cladding.
- Insulation will be installed with the reflective insulation closely fitted against any penetration, door or window opening.
- Insulation will be installed with the reflective insulation adequately supported by framing members.
- Insulation will be installed with each adjoining sheet of roll membrane being overlapped not less than 50 mm or taped together.
- Bulk insulation will be installed so that it maintains its position and thickness, other than where it crosses roof, battens, water pipe, electrical cabling or like.

4.2 PART J1.3 - ROOF AND CEILING CONSTRUCTION

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building and achieves the Total R-Value as specified in Table J1.3a for the direction of the heat flow.

2016 BCA – Vol. One Amendment 1: J1.3 Roof and Ceiling construction:

Minimum Total R-Value for each climate zone and for various surface Solar Absorptance Parameters.

Roof consistence of a metal roof sheeting, on steel framed roof structure, of different slope directions around the buildings. High point of the roof is from the center of the circle and discharges towards the outside of the building. Insulation has been added to areas above Home Base rooms, as indicated on the GA roof Plan sketch. No insulation over the COLA, lifts/stair zones and assembly area as these are classified as external zones outside of the thermal envelope.

With-in the Building Thermal Envelope area all insulation is with-in the roof zone and not the ceiling zone and will not require any ceiling loss adjustment due to exhaust fans, flues or recessed downlights.

TABLE A1.3a ROOF AND CEILING INSULATION PARAMETERS

BCA Climate Zone	5
Direction of heat flow	Downwards
Roof Colour/Material and Solar Absorptance value	Surfmist Colorbond Roof Sheeting Solar Absorptance value 0.32
Ceiling Loss adjustment -	Nil, all areas covered in an insulation within the Buildings Thermal Envelope
Total R-Value target	Surface solar absorptance value of not more than 0.4 = 3.2 Surface solar absorptance value of more than 0.4 but not more than 0.6 = 3.7

TABLE A1.3b ROOF AND CEILING CONSTRUCTION DETAILS

Roof Ident.	Element	Description	R-value
Metal roof with 13mm plasterboard ceiling.	1.	Outdoor air film (7m/s)	0.040
	2.	Roof (MRS): <i>Colorbond</i> Metal Roof Cladding and safety mesh (RSM)	0.000
	3.	Sarking (INSS): Bradford Enviroseal Proctor Wrap HTR	0.000
	4.	Thermal Break (INST): 10mm <i>Fletcher Thermatape high density polyethylene foam strip</i> adhesion to metal frame.	0.200
	5.	Roof Insulation (INSR): <i>Bradford Glasswool Anticon 100 Batts (100mm)</i> , faced with <i>RFL - medium duty reflective facing foil</i> for vapour control layer. Reflective foil facing ceiling air space. Batts located between 250mm roof purlins	2.300
	6.	Airspace: 100mm – 300mm (unventilated, reflective)	0.220
	7.	Ceiling Insulation (INSC): <i>Greenstuff ASL Soffit and Slab Liner (45mm)</i> , place on top of plasterboard.	1.00
	8.	Ceiling Material (CLP): 13mm plasterboard sheeting	0.070
	9.	Indoor air film (still air)	0.160
		TOTAL R-Value	3.990
		TOTAL R-Value Target	3.200

Conclusion: Roof and Ceiling Construction has Deemed-to-Satisfy compliance.

4.3 BCA PART J1.4 - ROOF LIGHTS

Compliance Not Applicable, No roof lights provided on this project.

4.4 BCA PART J1.5a - EXTERNAL Wall Construction

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building, achieves the Total R-Value as specified in Table J1.5a.

2016 BCA – Vol. One Amendment 1: J1.5a Options for each part of an external wall that is part of an envelope: Minimum total R-Value for each climate and various reduction parameters including Surface Absorptance Values.

The majority of the wall construction is blockwork below glazing and above light weight external cladding. All external walls will have insulation. Refer to Glazing calculations for glass information.

No reduction in insulation as allowable in the NCC (surface density, south orientation, shade angle projection etc) to ensure uniformity in construction around the building.

TABLE A1.5a1 EXTERNAL Wall PARAMETERS

BCA Climate Zone	5	
Total R-Value target	2.8	
Possible R-Value Reductions	For a wall with a surface density of not less than 220kg/m ² , and	- 0.50
	For a wall that is facing the south orientation, or	- 0.50
	For a wall shaded with a projection shade angle in accordance with Figure J1.5, and	- 0.50
Total R-Value target	2.8	

TABLE A1.5a EXTERNAL WALL ENVELOPE CONSTRUCTION DETAILS – FCP

Wall Ident.	Element	Description	R-value
Light weight cladding	1.	Outdoor air film (7m/s)	0.040
	2.	Cladding: FCE – Fibre Cement Cladding 9mm (1360kg/m ³)	0.040
	3.	Air Space: 35mm (unventilated and non reflective)	0.170
	4.	Sarking Breathable (INSS): Bradford CSR Envioseal Proctor Wall Wrap CW	0.000
	5.	Core: 150mm metal wall framing	0.000
	6.	Insulation: Bradford Gold Hi-Performance Wall Batts for steel frame walls (90mm 10.8kg/m ³)	2.500
	7.	Lining Material: Plasterboard wall lining (13mm)	0.070
	8.	Indoor air film (still air)	0.120
TOTAL R-Value			2.940
TOTAL R-Value Target			2.800

Conclusion: FCP has Deemed-to-Satisfy compliance

TABLE A1.5b EXTERNAL WALL ENVELOPE CONSTRUCTION DETAILS – BLK

Wall Ident.	Element	Description	R-value
Blockwork exposed	1.	Outdoor air film (7m/s)	0.040
	2.	Finish: 190mm Blockwork (BLK) (exposed) core filled	0.200
	3.	Air Space: 20mm (unventilated and non reflective)	0.170
	4.	Sarking (INSS): Bradford CSR Envioseal Proctor Wall Wrap CW	0.000
	5.	Core: 92mm metal wall framing	0.000
	6.	Insulation: Bradford Gold Hi-Performance Wall Batts for steel frame walls (90mm 10.8kg/m3)	2.500
	7.	Lining Material (PBIR): Plasterboard wall lining (13mm)	0.070
	8.	Indoor air film (still air)	0.120
TOTAL R-Value			3.100
TOTAL R-Value Target			2.800

Conclusion: BLK has Deemed-to-Satisfy compliance

TABLE A1.5c EXTERNAL WALL ENVELOPE CONSTRUCTION DETAILS – BRK

Wall Ident.	Element	Description	R-value
Brickwork exposed	1.	Outdoor air film (7m/s)	0.040
	2.	Core: 110mm Brickwork (BRK) (exposed)	0.170
	3.	Air Space: 50mm (unventilated and non reflective)	0.170
	4.	Sarking Breathable (INSS): Bradford CSR Envioseal Proctor Wall Wrap CW	0.000
	5.	Core: 150mm metal wall framing	0.000
	6.	Insulation: Bradford Gold Hi-Performance Wall Batts for steel frame walls (90mm 10.8kg/m3)	2.500
	7.	Lining Material (PB~): Plasterboard wall lining (13mm)	0.070
	8.	Indoor air film (still air)	0.120
TOTAL R-Value			3.070
TOTAL R-Value Target			2.800

Conclusion: BRK has Deemed-to-Satisfy compliance

4.5 BCA PART J1.5b - INTERNAL Wall Construction

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building, achieves the Total R-Value as specified in Table J1.5b.

The Staff room and Staff Annex adjacent the non AC Undercroft space located on the ground level has internal walls.

TABLE A1.5b1 INTERNAL Wall PARAMETERS

BCA Climate Zone	5	
Total R-Value target	Where the adjacent enclosed non-condition space does not comply with the items listed in Table J1.5b (a).	1.8

TABLE A1.5b2 INTERNAL WALL ENVELOPE DETAILS – BLK Internal

Wall Ident.	Element	Description	R-value
	1.	Indoor air film (still air)	0.120
	2.	Core: 190mm Blockwork hollow exposed	0.150
	3.	Core: 92mm metal stud framing	0.000
	4.	Insulation: Bradford Acoustigard 14 Wall Batts for steel frame walls (75mm 14kg/m3)	1.800
	5.	Lining Material: Gyprock wall lining (13mm)	0.070
	6.	Indoor air film (still air)	0.120
		TOTAL R-Value	2.260
		TOTAL R-Value Target	1.800

Conclusion: WTIO1 has Deemed-to-Satisfy compliance

4.6 BCA PART J1.6 - FLOOR CONSTRUCTION

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building, achieves the Total R-Value as specified in Table J1.6.

Concrete slab on ground without in slab cooling or heating system which according to the table below and NCC requires a minimum R-Value of Nil.

However some areas have air conditioned space above but outside the project building thermal envelope.

TABLE A1.6a FLOOR PARAMETERS

BCA Climate Zone	5
Direction of heat flow	Downwards
Total R-Value target downwards	A slab on ground without in slab heating or cooling Nil
Total R-Value target downwards	A suspended floor without in slab heating or cooling but non conditioned space is not enclosed 2.0

TABLE A1.6b FLOOR DETAILS – Exposed to exterior under slab soffit insulation

Wall Ident. Location and Orientation	Element	Description	R-value
	1.	Indoor air film (still air)	0.160
	2.	Finish: Carpet or Resilient vinyl	0.000
	3.	Core: Solid Concrete (150mm, 240 kg/m ²)	0.100
	4.	Insulation: <i>Kinspan Kooltherm K10 FM Soffit Board</i> 40mm	1.900
	5.	Outdoor air film (7m/s)	0.040
		TOTAL R-Value	2.200
		TOTAL R-Value Target	2.000

Conclusion: Floor has Deemed-to-Satisfy compliance

5.0 Deemed-to-Satisfy Report Details: Part J2 Glazing

5.1 BCA PART J2.4 - GLAZING

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building. The following requirements of glazing in the external fabric facing each orientation set out in J2.4 have been included in the specification of this project to ensure the energy efficiency of this building.

- The glazing in the building has been assessed separately in accordance with Option A. Where the glazing in each storey, including any mezzanine of a building must be assessed separately in accordance with J2.4(b) and J2.4(c) for (i) glazing in the external fabric facing each orientation and (ii) glazing in the internal fabric. Refer to Part 7 of this report for a completed Glazing Calculator Schedule.
- J2.4 (b) The aggregate air-conditioning energy value contributable to the glazing does not exceed the allowance obtained by multiplying the facade areas that is exposed to the conditioned space for that particular orientation by the energy index in BCA Table J2.4a
- J2.4 (c) The aggregate [air-conditioning](#) energy value must be calculated by adding the [air-conditioning](#) energy value through each [glazing](#) element in accordance with the formula nominated in the NCC/BCA
- External shading device complies with BCA Figure J2.4 method of measuring P and H

WINDOWS All external windows shall have a "Whole of Window" energy performance in accordance with the National Construction Code, Volume 1 (Section J), **values have been researched from the WERS website**, with a minimum performance of:

TABLE A11.1 GLAZING DETAILS

FIWI and AFC100 with GZ1	<i>Fixed Glass Window, AWS 400 Series, Single Glazed, 6.38mm, Viridian VLAM, Safety Laminated, Clear</i>
Uw	6.0
SHGCw	0.74
FIWI and AFC100 with GZ2	<i>Fixed Glass Window, AWS 400 Series, Single Glazed, 6.38mm, Viridian Comfort plus, Safety Laminated, Clear</i>
Uw	4.2
SHGCw	0.63
FIW2 and AFC100 with GZ1	<i>Fixed Glass Window, Capral 50 Series Pivot Suite, Single Glazed, 6.38mm, Viridian VLAM, Safety Laminated, Clear</i>
Uw	6.0
SHGCw	0.74
FIW2 and AFC100 with GZ2	<i>Fixed Glass Window, Capral 50 Series Pivot Suite, Single Glazed, 6.38mm, Viridian Comfort plus, Safety Laminated, Clear</i>
Uw	4.2
SHGCw	0.63
LVAG and AFC100 with GZ1	<i>Adjustable Glass Louvres, Safetyline Jalouise, Single Glazed, 6.38mm, Viridian VLAM, Safety Laminated, Clear</i>
Uw	4.6
SHGCw	0.65

LVAG and AFC100 with GZ2	<i>Adjustable Glass Louvres, Safetyline Jalouise, Single Glazed, 6.38mm, Viridian Comfort plus ,Safety Laminated, Clear</i>
Uw	4.8
SHGCw	0.49
WSVS and AFC100 with GZ1	<i>Sash-less Vertical Sliding Window, Aneeta Sash-less Double Hung, Single Glazed, 6.38mm, Viridian VLAM, Safety Laminated, Clear</i>
Uw	6.0
SHGCw	0.62
WSVS and AFC100 with GZ2	<i>Sash-less Vertical Sliding Window, Aneeta Sash-less Double Hung, Single Glazed, 6.38mm, Viridian Comfort plus ,Safety Laminated, Clear</i>
Uw	4.4
SHGCw	0.40
PW and AFC100 with GZ1	<i>Pivot Window, Capral 50 Series Pivot Suite, Single Glazed, 6.38mm, Viridian VLAM, Safety Laminated, Clear</i>
Uw	6.5
SHGCw	0.43
PW and AFC100 with GZ2	<i>Pivot Window, Capral 50 Series Pivot Suite,, Single Glazed, 6.38mm, Viridian Comfort plus ,Safety Laminated, Clear</i>
Uw	5.9
SHGCw	0.28
FIW1 and AFC150D with GZ3	<i>Fixed Glass Window, AWS 624 series, Double Glazed, 6.38mm, Viridian Comfort plus, air gap and 6mm clear float ,Safety Laminated, Clear</i>
Uw	2.8
SHGCw	0.55

Conclusion: Refer Glazing Calculator attached

5.2 BCA PART J2.5 - SHADING

The Deemed-to-Satisfy Provisions of this part apply to shading elements and where shading is required to comply with J2.4 needs to be provided by an external permanent projection or be provided by an external shading device and comply with J2.5.

- The Shading is provided by an external permanent projection, which
 - Extends horizontally on both sides of the glazing for the same projection distance nominated in BCA Figure J2.4 or
 - Provides the equivalent shading with a reveal or the like or
- The Shading is provided by an external screen/blind system, which
 - Is capable of restricting at least 80% of the summer solar radiation and
 - Is adjustable is operated automatically in response to the level of solar radiation.

Conclusion: Refer Glazing Calculator attached

6.0 Deemed-to-Satisfy Report Details: Part J3 Building Sealing

6.1 BCA PART J3.1 - APPLICATION OF PART

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building. Building sealing has been included in the specification requirements of this project to ensure the energy efficiency of this building.

6.2 BCA PART J3.2 - CHIMNEYS AND FLUES

Compliance Not Applicable,

6.3 BCA PART J3.3 - ROOF LIGHTS

Compliance Not Applicable,

6.4 BCA PART J3.4 - WINDOWS AND DOORS

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building.

A seal to restrict air infiltration must be fitted to each edge of a door, operable window or the like forming part of the envelope of a conditioned space.

- All doors specify to have weather seals to edges.
- The specification calls for all window and door frames to be fully sealed to the sarking layers in the walls (also fully sealed) to prevent air infiltration.

6.5 BCA PART J3.5 - EXHAUST FANS

Compliance Not Applicable,

6.6 BCA PART J3.6 - CONSTRUCTION OF ROOFS, WALLS AND FLOORS

The Deemed-to-Satisfy Provisions of this part apply to building elements forming the envelope of a building. Eg;

Roof, ceilings, walls, floors and any opening such as a window frame, door frame, roof light frame or the like must be constructed to minimise air leakage when forming part of the envelope.

- The roof and wall construction has specified and detailed to be fully sealed using a thermal vapour barrier that overlaps adjoining thermal vapour barrier.
- The thermal vapour barrier is also specified and detailed to be fitted tightly to each side of framing members and against any penetrations, door and window openings.
- This is taken to mean all overlapping edges, and between the roof and walls. It is also fully sealed to the frames of doors and windows to provide a fully complying seal system to the external fabric.
- Wall, window and door details also nominate caulking, skirting, cornices and such for additional sealing.

6.7 BCA PART J3.7 - EVAPORATIVE COOLER

Compliance Not Applicable,

7.0 Deemed-to-Satisfy Report Details: Part J5 J6 J7 J8 Building Services

7.1 BCA PART J5 - AIR CONDITIONING AND VENTILATION SYSTEMS

Refer attached Mechanical Engineer design certification report – Form 15.

7.2 BCA PART J6 - ARTIFICIAL LIGHTING AND POWER

Refer attached Electrical Engineer design certification report – Form 15.

7.3 BCA PART J7 - HEATED WATER SUPPLY AND SWIMMING POOL AND SPA POOL PLANT

7.3.1 BCA PART J7.2 - HOT WATER SUPPLY

Refer attached Hydraulic Consultants design certification report – Form 15.

7.3.2 BCA PART J7.3 - SWIMMING POOL HEATING AND PUMPING

Compliance Not Applicable, **BCA PART J7.4 - SPA POOL HEATING AND PUMPING**

Compliance Not Applicable, **BCA PART J8 - FACILITIES FOR ENERGY
MONITORING**

7.4.1 BCA PART J8.3 - FACILITIES FOR ENERGY MONITORING

Refer attached Electrical Engineer design certification report – Form 15.

8.0 Appendices – Attachment Glazing Calculator & Engineering Certificates

8.1 BCA PART J2.4 - GLAZING

The glazing in the building has been assessed separately in accordance with Option A refer to attached Glazing Calculator Spreadsheet attached.

Refer to attached glazing calculator sheets for each building in addition to diagrams highlighting conditioned spaces and associated glazing

NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

Smalls Road Ryde Public School - Ground level, Blocks 1,2 and 3

Application

other

Climate zone

5

Storey

1

Facade areas

N	NE	E	SE	S	SW	W	NW	internal
146m ²	145m ²	94.3m ²	82.8m ²	139m ²	74.2m ²	70.1m ²		
								n/a

Option A

Option B

Glazing area (A) 43.1m² 10.6m² 3.02m² 6.83m² 43.9m² 4.79m² 4.56m²

Number of rows preferred in table below

25 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES OK (if inputs are valid)							
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
1	G03B WT16	N		3.40	6.35		2.8	0.55	1.400	3.600	0.39	0.20	0.97	0.78	21.57	50% of 91%	
2	G03A WT16	N		3.40	6.35		2.8	0.55	1.400	3.600	0.39	0.20	0.97	0.78	21.57	50% of 91%	
3	G01A WT20	W		2.35	0.97		4.6	0.65	7.906	4.600	0.00	2.25	1.00	1.00	2.28	50% of 24%	
4	G01A WT20	W		2.35	0.97		4.6	0.65	7.906	4.600	0.00	2.25	1.00	1.00	2.28	50% of 24%	
5	G03A WT15	S		2.41	3.75		4.2	0.63	1.400	3.600	0.39	1.19	0.97	0.95	9.04	21% of 46%	
6	G03B WT15	S		2.41	3.75		4.2	0.63	1.400	3.600	0.39	1.19	0.97	0.95	9.04	21% of 46%	
7	G03A WT15	S		2.41	5.36		4.2	0.63	1.400	3.600	0.39	1.19	0.97	0.95	12.92	29% of 46%	
8	G03B WT15	S		2.41	5.36		4.2	0.63	1.400	3.600	0.39	1.19	0.97	0.95	12.92	29% of 46%	
9	G08 D03	SE		2.34	1.84		5.8	0.53	7.906	4.600	0.00	2.26	1.00	1.00	4.31	64% of 22%	
10	G08 WT17	SE		0.60	4.20		4.6	0.65	7.906	4.600	0.00	4.00	1.00	1.00	2.52	36% of 22%	
11	G08 WT13	SW		3.35	0.84		4.6	0.65				0.00	1.00	1.00	2.82	59% of 15%	
12	G08 WT13	SW		2.35	0.84		4.6	0.65				0.00	1.00	1.00	1.98	41% of 15%	
13	G12B WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	21% of 25%	
14	G12A WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	13% of 25%	
15	G11 WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	13% of 25%	
16	G10B WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	13% of 25%	
17	G10A WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	13% of 25%	
18	G09B WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	13% of 25%	
19	G09A WT01	NE		1.56	0.97		4.4	0.40				0.00	1.00	1.00	1.51	13% of 25%	
20	G16B WT01	E		1.56	0.97		6.0	0.62	1.400	4.600	0.00	3.04	1.00	1.00	1.51	50% of 13%	
21	G16A WT01	E		1.56	0.97		6.0	0.62	1.400	4.600	0.00	3.04	1.00	1.00	1.51	50% of 13%	

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used
22																
23																
24																
25																

IMPORTANT NOTICE AND DISCLAIMER IN RESPECT OF THE GLAZING CALCULATOR

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if inputs are valid



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NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

Smalls Road Ryde Public School - Ground level, Blocks 4, 5 6

Application

other

Climate zone

5

Storey

1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	58.1m ²	45.4m ²		106m ²				114m ²	
Option B									n/a

Glazing area (A) 12.5m² 24.1m² 11.9m² 10.6m²

Number of rows preferred in table below

20 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
1	G34 WT15	NE		1.50	3.80		2.8	0.55	1.400	3.600	0.00	2.10	1.00	1.00	5.70	59% of 95%	
2	G35B WT15	N		1.50	4.06		2.8	0.55	1.400	3.600	0.00	2.10	1.00	1.00	6.10	49% of 89%	
3	G35A WT15	N		1.50	4.29		2.8	0.55	1.400	3.600	0.00	2.10	1.00	1.00	6.43	51% of 89%	
4	G55B WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
5	G54A WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
6	G54B WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
7	G52 WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
8	G50B WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
9	G50A WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
10	G49 WT01	NW		1.56	0.97		4.4	0.40	1.400	3.600	0.00	2.04	1.00	1.00	1.51	14% of 24%	
11	G56 WT18 D01	NE		2.35	7.18		6.0	0.74	device		2.00	0.00	0.00	0.20	16.87	38% of 95%	
12	G55A WT01	NE		1.56	0.97		6.0	0.62	device		2.00	0.00	0.00	0.20	1.51	3% of 95%	
13	G44 WT01	SE		1.56	0.97		6.0	0.62	1.400	3.600	0.00	2.04	1.00	1.00	1.51	13% of 32%	
14	G45 WT01	SE		1.56	0.97		6.0	0.62	1.400	3.600	0.00	2.04	1.00	1.00	1.51	13% of 32%	
15	G47 WT01	SE		1.56	0.97		6.0	0.62	1.400	3.600	0.00	2.04	1.00	1.00	1.51	13% of 32%	
16	G48A WT01	SE		1.56	0.97		6.0	0.62	1.400	3.600	0.00	2.04	1.00	1.00	1.51	13% of 32%	
17	G48B WT01	SE		1.56	0.97		6.0	0.62	1.400	3.600	0.00	2.04	1.00	1.00	1.51	13% of 32%	
18	G48 D01	SE		2.34	1.84		5.8	0.53	1.400	3.600	0.39	1.26	0.98	0.96	4.31	34% of 32%	
19																	
20																	

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used

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if inputs are valid



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NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

Smalls Road Ryde Public School - Level 1, Block 1,2 and 3

Application

other

Climate zone

5

Storey

1

Facade areas

N	NE	E	SE	S	SW	W	NW	internal
168m ²	114m ²	168m ²	54m ²	131m ²	58.1m ²	131m ²	54m ²	
								n/a

Option A

Option B

Glazing area (A) 41.1m² 32.1m² 33.1m² 8.97m² 22.8m² 22m² 30.6m² 0.86m²

Number of rows preferred in table below

75 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
1	L105	WT04	N		1.50	4.50	4.2	0.63	device		2.00	0.00	0.00	0.19	6.75	10% of 22%	
2	L104	WT02	N		1.50	2.27	4.2	0.63	device		2.00	0.00	0.00	0.19	3.41	5% of 22%	
3	L104	WT03	N		1.50	3.39	4.2	0.63	device		2.00	0.00	0.00	0.19	5.08	7% of 22%	
4	L103	WT05	N		1.50	5.61	4.2	0.63	device		2.00	0.00	0.00	0.19	8.42	12% of 22%	
5	L102	WT02	N		1.50	2.27	4.2	0.63	device		2.00	0.00	0.00	0.19	3.41	5% of 22%	
6	L102	WT03	N		1.50	3.39	4.2	0.63	device		2.00	0.00	0.00	0.19	5.08	7% of 22%	
7	L102A	WTSO	W		0.80	1.17	6.5	0.28	7.906	3.600	0.00	2.80	1.00	1.00	0.94	2% of 74%	
8	L102	WTSF	W		0.80	1.22	6.0	0.74	7.906	3.600	0.00	2.80	1.00	1.00	0.98	4% of 74%	
9	L101	WTSF	W		0.80	1.07	6.0	0.74	7.906	3.600	0.00	2.80	1.00	1.00	0.86	4% of 74%	
10	L101	WTLO	W		1.20	0.72	6.5	0.28	7.906	3.600	0.00	2.40	1.00	1.00	0.86	2% of 74%	
11	L101	D03	W		2.34	0.92	4.4	0.50	7.906	3.600	2.20	1.26	0.67	0.56	2.15	4% of 74%	
12	L101	WT09	W		2.38	1.20	4.6	0.65	7.906	3.600	2.20	1.22	0.67	0.56	2.86	6% of 74%	
13	L111	WTSO	E		0.80	1.22	6.5	0.28	7.906	3.600	0.00	2.80	1.00	1.00	0.98	3% of 39%	
14	L101A	WT07	S		1.50	0.90	4.4	0.40	1.400	3.600	0.00	2.10	1.00	1.00	1.35	5% of 34%	
15	L101B	WT07	S		1.50	0.90	4.4	0.40	1.400	3.600	0.00	2.10	1.00	1.00	1.35	5% of 34%	
16	L101A	WT08	S		2.40	0.83	4.8	0.49	1.400	3.600	0.39	1.20	0.97	0.95	1.99	8% of 34%	
17	L101B	WT08	S		2.40	0.83	4.8	0.49	1.400	3.600	0.39	1.20	0.97	0.95	1.99	8% of 34%	
18	L101C	WT08	S		2.40	0.83	4.6	0.65	1.400	3.600	0.39	1.20	0.97	0.95	1.99	7% of 34%	
19	L101D	WT08	S		2.40	0.83	4.6	0.65	1.400	3.600	0.39	1.20	0.97	0.95	1.99	7% of 34%	
20	L101C	WT07	S		1.50	0.90	6.0	0.62	1.400	3.600	0.00	2.10	1.00	1.00	1.35	7% of 34%	
21	L101D	WT07	S		1.50	0.90	6.0	0.62	1.400	3.600	0.00	2.10	1.00	1.00	1.35	7% of 34%	

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
57	L120	WTLO	N		1.20	0.72	6.5	0.28	7.906	3.600	0.00	2.40	1.00	1.00	0.86	4% of 22%	
58	L119	D01	N		2.34	0.92	5.8	0.53	7.906	3.600	2.20	1.26	0.56	0.36	2.15	5% of 22%	
59	L119	WT09	N		2.38	1.20	4.6	0.65	7.906	3.600	2.20	1.22	0.56	0.36	2.86	11% of 22%	
60	L127	WTLO	S		1.20	0.72	6.5	0.28	7.906	3.600	0.00	2.40	1.00	1.00	0.86	5% of 34%	
61	L128A	WT07	W		1.50	0.90	6.0	0.62	1.400	3.600	0.00	2.10	1.00	1.00	1.35	5% of 74%	
62	L128B	WT07	W		1.50	0.90	6.0	0.62	1.400	3.600	0.00	2.10	1.00	1.00	1.35	5% of 74%	
63	L119A	WT07	W		1.50	0.90	6.0	0.62	1.400	3.600	0.00	2.10	1.00	1.00	1.35	5% of 74%	
64	L119B	WT07	W		1.50	0.90	6.0	0.62	1.400	3.600	0.00	2.10	1.00	1.00	1.35	5% of 74%	
65	L129A	WT08	W		2.40	0.83	4.6	0.65	1.400	3.600	0.39	1.20	0.97	0.94	1.99	7% of 74%	
66	L129	D01	W		2.34	1.84	5.8	0.53	1.400	3.600	0.39	1.26	0.98	0.97	4.31	14% of 74%	
67	L129B	WT08	W		2.40	0.83	4.6	0.65	1.400	3.600	0.39	1.20	0.97	0.94	1.99	7% of 74%	
68	L129C	WT08	W		2.40	0.83	4.6	0.65	1.400	3.600	0.39	1.20	0.97	0.94	1.99	7% of 74%	
69	L129	D01	W		2.34	1.84	5.8	0.53	1.400	3.600	0.39	1.26	0.98	0.97	4.31	14% of 74%	
70	L129D	WT08	W		2.40	0.83	4.6	0.65	1.400	3.600	0.39	1.20	0.97	0.94	1.99	7% of 74%	
71																	
72																	
73																	
74																	
75																	

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if inputs are valid



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NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

Smalls Road Ryde Public School - Level 1, Block 4, 5 and 6

Application

other

Climate zone

5

Storey

1

Facade areas

	N	NE	E	SE	S	SW	W	NW	internal
Option A	77.4m ²	131m ²	54m ²	131m ²	125m ²	168m ²	54m ²	168m ²	
Option B									n/a

Glazing area (A) 22m² 22.5m² 0.86m² 30.9m² 36.1m² 18.6m² 8.91m² 32.1m²

Number of rows preferred in table below

70 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS										SHADING		CALCULATED OUTCOMES OK (if inputs are valid)					
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes	
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
1	L136 WT03	S		1.50	3.39		6.0	0.74	device		2.00	0.00	0.64	0.54	5.08	14% of 61%	
2	L136 WT11	S		2.34	1.27		6.0	0.74				0.00	1.00	1.00	2.98	8% of 61%	
3	L136 D02	S		2.34	0.92		5.8	0.53				0.00	1.00	1.00	2.15	6% of 61%	
4	L136 D01	S		2.34	0.92		5.8	0.53				0.00	1.00	1.00	2.15	6% of 61%	
5	L135 WT04	S		1.50	4.50		6.0	0.74	device		2.00	0.00	0.64	0.54	6.75	18% of 61%	
6	L134 WT03	S		1.50	3.39		6.0	0.74	device		2.00	0.00	0.64	0.54	5.08	14% of 61%	
7	L133 WT04	S		1.50	4.50		6.0	0.74	device		2.00	0.00	0.64	0.54	6.75	18% of 61%	
8	L133 WTLO	E		1.20	0.72		6.5	0.28				0.00	1.00	1.00	0.86	100% of 3%	
9	L139 WT09	W		2.38	1.20		4.6	0.65				0.00	1.00	1.00	2.86	35% of 56%	
10	L139 D01	W		2.34	0.92		5.8	0.53				0.00	1.00	1.00	2.15	23% of 56%	
11	L120 WTLO	W		1.20	0.72		6.5	0.28				0.00	1.00	1.00	0.86	6% of 56%	
12	L165 WTSF	W		0.80	1.07		6.0	0.74				0.00	1.00	1.00	0.86	12% of 56%	
13	L122A WTLF	W		1.20	0.92		6.0	0.74				0.00	1.00	1.00	1.10	16% of 56%	
14	L122B WTLO	W		1.20	0.90		6.5	0.28				0.00	1.00	1.00	1.08	8% of 56%	
15	L130B WT07	N		1.50	0.90		4.4	0.40	1.200	3.600	0.00	2.10	1.00	1.00	1.35	5% of 88%	
16	L130A WT07	N		1.50	0.90		4.4	0.40	1.200	3.600	0.00	2.10	1.00	1.00	1.35	5% of 88%	
17	L132D WT08	N		2.40	0.83		4.8	0.49	1.200	3.600	0.33	1.20	0.99	0.92	1.99	9% of 88%	
18	L132 D01	N		2.34	1.84		5.8	0.53	1.200	3.600	0.33	1.26	1.00	0.95	4.31	21% of 88%	
19	L132C WT08	N		2.40	0.83		4.8	0.49	1.200	3.600	0.33	1.20	0.99	0.92	1.99	9% of 88%	
20	L132B WT08	N		2.40	0.83		4.8	0.49	1.200	3.600	0.33	1.20	0.99	0.92	1.99	9% of 88%	
21	L132 D02	N		2.34	1.84		5.8	0.53	1.200	3.600	0.33	1.26	1.00	0.95	4.31	21% of 88%	

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m²)	Element share of % of allowance used	
22	L132A	WT08	N	2.40	0.83		4.8	0.49	1.200	3.600	0.33	1.20	0.99	0.92	1.99	9% of 88%	
23	L139B	WT07	N	1.50	0.90		4.4	0.40	1.200	3.600	0.00	2.10	1.00	1.00	1.35	5% of 88%	
24	L139A	WT07	N	1.50	0.90		4.4	0.40	1.200	3.600	0.00	2.10	1.00	1.00	1.35	5% of 88%	
25	L134	WT11	S	2.34	1.27		6.0	0.74				0.00	1.00	1.00	2.98	8% of 61%	
26	L134	D01	S	2.34	0.92		5.8	0.53				0.00	1.00	1.00	2.15	6% of 61%	
27	L143	WT03	SW	1.50	3.39		4.2	0.63	device		2.00	0.00	0.39	0.34	5.08	27% of 16%	
28	L146	WT02	SW	1.50	2.27		4.2	0.63	device		2.00	0.00	0.39	0.34	3.41	18% of 16%	
29	L154	WT03	SW	1.50	3.39		4.2	0.63	device		2.00	0.00	0.39	0.34	5.08	27% of 16%	
30	L147	WT03	SW	1.50	3.39		4.2	0.63	device		2.00	0.00	0.39	0.34	5.08	27% of 16%	
31	L114A	WTSO	SE	0.80	0.72		6.0	0.28				0.00	1.00	1.00	0.58	2% of 63%	
32	L114	WTLF	SE	1.20	0.72		6.0	0.74				0.00	1.00	1.00	0.86	3% of 63%	
33	L114B	WTSO	SE	0.80	1.07		6.0	0.28				0.00	1.00	1.00	0.86	2% of 63%	
34	L116	WTSO	SE	0.80	1.07		6.5	0.28				0.00	1.00	1.00	0.86	3% of 63%	
35	L116	WTSF	SE	0.80	1.02		6.0	0.74				0.00	1.00	1.00	0.82	3% of 63%	
36	L142	D01	SE	2.40	0.92		5.8	0.63				0.00	1.00	1.00	2.21	8% of 63%	
37	L142	WT09	SE	2.38	1.20		4.6	0.65				0.00	1.00	1.00	2.86	9% of 63%	
38	L140	WT07	NE	1.50	0.90		4.4	0.40				0.00	1.00	1.00	1.35	4% of 74%	
39	L141	WT07	NE	1.50	0.90		4.4	0.40				0.00	1.00	1.00	1.35	4% of 74%	
40	L144A	WT08	NE	2.40	0.83		4.8	0.49				0.00	1.00	1.00	1.99	8% of 74%	
41	L144B	WT08	NE	2.40	0.83		4.8	0.49				0.00	1.00	1.00	1.99	8% of 74%	
42	L149	WT07	NE	1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	7% of 74%	
43	L152	WT07	NE	1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	7% of 74%	
44	L160	WT04	NW	1.50	4.50		4.2	0.63	device		2.00	0.00	0.00	0.21	6.75	21% of 16%	
45	L163	WT02	NW	1.50	2.27		4.2	0.63	device		2.00	0.00	0.00	0.21	3.41	11% of 16%	
46	L163	WT03	NW	1.50	3.39		4.2	0.63	device		2.00	0.00	0.00	0.21	5.08	16% of 16%	
47	L162	WT05	NW	1.50	5.61		4.2	0.63	device		2.00	0.00	0.00	0.21	8.42	26% of 16%	
48	L161	WT02	NW	1.50	2.27		4.2	0.63	device		2.00	0.00	0.00	0.21	3.41	11% of 16%	
49	L161	WT03	NW	1.50	3.39		4.2	0.63	device		2.00	0.00	0.00	0.21	5.08	16% of 16%	
50	L165	WTSF	NE	0.80	1.07		6.0	0.74				0.00	1.00	1.00	0.86	5% of 74%	
51	L163A	WTLO	NE	1.20	0.72		6.5	0.28				0.00	1.00	1.00	0.86	2% of 74%	
52	L166	D01	NE	2.34	0.92		4.4	0.50				0.00	1.00	1.00	2.15	9% of 74%	
53	L166	WT09	NE	2.38	1.20		4.6	0.65				0.00	1.00	1.00	2.86	15% of 74%	
54	L157A	WT07	SE	1.50	0.90		4.4	0.40				0.00	1.00	1.00	1.35	3% of 63%	
55	L157B	WT07	SE	1.50	0.90		4.4	0.40				0.00	1.00	1.00	1.35	3% of 63%	
56	L167A	WT08	SE	2.40	0.83		4.8	0.49				0.00	1.00	1.00	1.99	6% of 63%	

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
57	L167B WT08	SE		2.40	0.83		4.8	0.49				0.00	1.00	1.00	1.99	6% of 63%	
58	L167C WT08	SE		2.40	0.83		4.6	0.65				0.00	1.00	1.00	1.99	6% of 63%	
59	L167D WT08	SE		2.40	0.83		4.6	0.65				0.00	1.00	1.00	1.99	6% of 63%	
60	L166A WT07	SE		1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	5% of 63%	
61	L166B WT07	SE		1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	5% of 63%	
62	L166A D01	NE		2.34	1.84		5.8	0.63				0.00	1.00	1.00	4.31	22% of 74%	
63	L163B WTLF	NE		1.20	1.07		6.0	0.74				0.00	1.00	1.00	1.28	8% of 74%	
64	L165 WTLO	NE		1.20	0.70		6.5	0.28				0.00	1.00	1.00	0.84	2% of 74%	
65	L167 D01	SE		2.30	1.84		5.8	0.63				0.00	1.00	1.00	4.23	15% of 63%	
66	L167 D02	SE		2.30	1.84		5.8	0.63				0.00	1.00	1.00	4.23	15% of 63%	
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if inputs are valid



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GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
22	L211C	WT08	S		2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	0.98	0.96	1.99	7% of 34%
23	L211D	WT08	S		2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	0.98	0.96	1.99	7% of 34%
24	L210A	WT07	S		1.50	0.90		6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	6% of 34%
25	L210B	WT07	S		1.50	0.90		6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	6% of 34%
26	L211	D01	S		2.34	1.84		5.8	0.53	1.800	3.800	0.47	1.46	0.98	0.96	4.31	20% of 34%
27	L211	D02	S		2.34	1.84		5.8	0.53	1.800	3.800	0.47	1.46	0.98	0.96	4.31	20% of 34%
28	L220	WT05	NE		1.50	5.61		4.2	0.63	device		2.00	0.00	0.00	0.20	8.42	25% of 25%
29	L219	WT03	NE		1.50	3.39		4.2	0.63	device		2.00	0.00	0.00	0.20	5.08	15% of 25%
30	L219	WT02	NE		1.50	2.27		4.2	0.63	device		2.00	0.00	0.00	0.20	3.41	10% of 25%
31	L218	WT05	NE		1.50	5.61		4.2	0.63	device		2.00	0.00	0.00	0.20	8.42	25% of 25%
32	L217	WT02	NE		1.50	2.27		4.2	0.63	device		2.00	0.00	0.00	0.20	3.41	10% of 25%
33	L217	WT03	NE		1.50	3.39		4.2	0.63	device		2.00	0.00	0.00	0.20	5.09	15% of 25%
34	L217A	WTLO	NW		1.20	0.72		6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	0.86	12% of 21%
35	L217B	WTLF	NW		1.20	0.72		6.0	0.74	7.906	3.800	0.00	2.60	1.00	1.00	0.86	36% of 21%
36	L215A	WT14	NW		0.60	1.20		4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	26% of 21%
37	L215B	WT14	NW		0.60	1.20		4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	26% of 21%
38	L223	WT09	SE		2.38	1.20		4.6	0.65	7.906	3.800	2.08	1.42	0.73	0.59	2.86	27% of 35%
39	L223	D01	SE		2.34	0.92		5.8	0.53	7.906	3.800	2.08	1.46	0.73	0.59	2.15	23% of 35%
40	L222	WTLO	SE		1.20	0.72		6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	0.86	11% of 35%
41	L222	WTSF	SE		0.80	1.07		6.0	0.74	7.906	3.800	0.00	3.00	1.00	1.00	0.86	14% of 35%
42	L220A	WTLF	SE		1.20	0.92		6.0	0.74	7.906	3.800	0.00	2.60	1.00	1.00	1.10	18% of 35%
43	L220B	WTSO	SE		0.80	0.72		6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.58	7% of 35%
44	L214A	WT07	SW		1.50	0.90		6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 84%
45	L214B	WT07	SW		1.50	0.90		6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 84%
46	L224A	WT08	SW		2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	0.97	0.95	1.99	8% of 84%
47	L224A	D01	SW		2.34	1.84		5.8	0.53	1.800	3.800	0.47	1.46	0.97	0.95	4.31	20% of 84%
48	L224B	WT08	SW		2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	0.97	0.95	1.99	8% of 84%
49	L224C	WT08	SW		2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	0.97	0.95	1.99	8% of 84%
50	L224A	D01	SW		2.34	1.84		5.8	0.53	1.800	3.800	0.47	1.46	0.97	0.95	4.31	20% of 84%
51	L224D	WT08	SW		2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	0.97	0.95	1.99	8% of 84%
52	L223A	WT07	SW		1.50	0.90		6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 84%
53	L223B	WT07	SW		1.50	0.90		6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 84%
54	L231	WT02	E		1.50	2.27		6.0	0.74	device		2.00	0.00	0.00	0.25	3.41	8% of 35%
55	L231	WT03	E		1.50	3.39		6.0	0.74	device		2.00	0.00	0.00	0.25	5.08	12% of 35%
56	L230	WT05	E		1.50	5.61		6.0	0.74	device		2.00	0.00	0.00	0.25	8.42	19% of 35%

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _w)	Cooling (S _c)	Area used (m²)	Element share of % of allowance used	
57	L229	WT02	E		1.50	2.27	6.0	0.74	device		2.00	0.00	0.00	0.25	3.41	8% of 35%	
58	L229	WT03	E		1.50	3.39	6.0	0.74	device		2.00	0.00	0.00	0.25	5.08	12% of 35%	
59	L228	WT05	E		1.50	5.61	6.0	0.74	device		2.00	0.00	0.00	0.25	8.42	19% of 35%	
60	L233A	WT14	S		0.60	1.20	4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	3% of 34%	
61	L223B	WT14	S		0.60	1.20	4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	3% of 34%	
62	L231	WTSO	S		0.80	0.72	6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.58	3% of 34%	
63	L234B	WT07	W		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 51%	
64	L234A	WT07	W		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 51%	
65	L225B	WT07	W		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 51%	
66	L225A	WT07	W		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	7% of 51%	
67	L235D	WT08	W		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.98	0.96	1.99	10% of 51%	
68	L235C	WT08	W		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.98	0.96	1.99	10% of 51%	
69	L235B	WT08	W		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.98	0.96	1.99	10% of 51%	
70	L235A	WT08	W		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.98	0.96	1.99	10% of 51%	
71	L228	WTLF	N		1.20	0.90	6.0	0.74	7.900	3.600	0.00	2.40	1.00	1.00	1.08	15% of 22%	
72	L228	WTSO	N		0.80	1.07	6.5	0.28	7.900	3.600	0.00	2.80	1.00	1.00	0.86	3% of 22%	
73	L227	WTSF	N		0.80	0.72	6.0	0.74	7.900	3.600	0.00	2.80	1.00	1.00	0.58	8% of 22%	
74	L227	WTLO	N		1.20	0.72	6.5	0.28	7.900	3.600	0.00	2.40	1.00	1.00	0.86	3% of 22%	
75	L225	D01	N		2.34	0.92	5.8	0.53	7.900	3.600	2.19	1.26	0.56	0.36	2.15	5% of 22%	
76	L225	WT09	N		2.38	1.20	4.6	0.65	7.900	3.600	2.19	1.22	0.56	0.36	2.86	10% of 22%	
77	L225A	D01	N		2.34	1.84	5.8	0.53	7.900	3.600	2.19	1.26	0.56	0.36	4.31	9% of 22%	
78																	
79																	
80																	

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if inputs are valid



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NCC VOLUME ONE GLAZING CALCULATOR (first issued with NCC 2014)

Building name/description

Smalls Road Ryde Public School - Level 2, Block 4,5 and 6

Application

other

Climate zone

5

Storey

1

Facade areas

Option A

Option B

Glazing area (A)

N	NE	E	SE	S	SW	W	NW	internal
81.7m ²	139m ²	57m ²	139m ²	120m ²	177m ²	57m ²	177m ²	
								n/a
22m ²	34.9m ²	2.02m ²	30.6m ²	33.8m ²	36.9m ²	9.24m ²	40.7m ²	

Number of rows preferred in table below

80 (as currently displayed)

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS								SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element		Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used
1	L242	WT05	S	1.50	5.61		6.0	0.74	device		2.00	0.00	0.64	0.54	8.42	25% of 59%
2	L241	WT03	S	1.50	3.39		6.0	0.74	device		2.00	0.00	0.64	0.54	5.08	15% of 59%
3	L241	WT02	S	1.50	2.27		6.0	0.74	device		2.00	0.00	0.64	0.54	3.41	10% of 59%
4	L240	WT05	S	1.50	5.61		6.0	0.74	device		2.00	0.00	0.64	0.54	8.42	25% of 59%
5	L241	WT02	S	1.50	2.27		6.0	0.74	device		2.00	0.00	0.64	0.54	3.41	10% of 59%
6	L239	WT03	S	1.50	3.39		6.0	0.74	device		2.00	0.00	0.64	0.54	5.08	15% of 59%
7	L239	WTLO	E	1.20	0.48		6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	0.58	15% of 13%
8	L237B	WT14	E	0.60	1.20		4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	43% of 13%
9	L237A	WT14	E	0.60	1.20		4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	43% of 13%
10	L245	WT09	W	2.38	1.20		4.6	0.65				0.00	1.00	1.00	2.86	36% of 52%
11	L245	D01	W	2.34	0.92		5.8	0.53				0.00	1.00	1.00	2.15	24% of 52%
12	L244	WTLO	W	1.20	0.90		6.5	0.28				0.00	1.00	1.00	1.08	8% of 52%
13	L265	WTSF	W	0.80	0.72		6.0	0.74				0.00	1.00	1.00	0.58	8% of 52%
14	L266	WTSO	W	0.80	1.07		6.5	0.28				0.00	1.00	1.00	0.86	6% of 52%
15	L242	WTLF	W	1.20	0.72		6.0	0.74				0.00	1.00	1.00	0.86	13% of 52%
16	L266	WTSO	W	0.80	1.07		6.5	0.28				0.00	1.00	1.00	0.86	6% of 52%
17	L236A	WT07	N	1.50	0.90		4.4	0.40	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%
18	L236B	WT07	N	1.50	0.90		4.4	0.40	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%
19	L246A	WT08	N	2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	1.00	0.92	1.99	11% of 93%
20	L246	D01	N	2.34	1.84		5.8	0.53	1.800	3.800	0.47	1.46	1.00	0.92	4.31	18% of 93%
21	L246B	WT08	N	2.40	0.83		4.6	0.65	1.800	3.800	0.47	1.40	1.00	0.92	1.99	11% of 93%

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m²)	Element share of % of allowance used	
22	L246C	WT08	N		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	1.00	0.92	1.99	11% of 93%	
23	L246	D01	N		2.34	1.84	5.8	0.53	1.800	3.800	0.47	1.46	1.00	0.92	4.31	18% of 93%	
24	L246D	WT08	N		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	1.00	0.92	1.99	11% of 93%	
25	L245B	WT07	N		1.50	0.90	4.4	0.40	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%	
26	L245A	WT07	N		1.50	0.90	4.4	0.40	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%	
27	L253	WT02	SW		1.50	2.27	4.2	0.63	device		2.00	0.00	0.39	0.34	3.41	9% of 32%	
28	L253	WT03	SW		1.50	3.39	4.2	0.63	device		2.00	0.00	0.39	0.34	5.09	13% of 32%	
29	L252	WT05	SW		1.50	5.61	4.2	0.63	device		2.00	0.00	0.39	0.34	8.42	22% of 32%	
30	L251	WT02	SW		1.50	2.27	4.2	0.63	device		2.00	0.00	0.39	0.34	3.41	9% of 32%	
31	L251	WT03	SW		1.50	3.39	4.2	0.63	device		2.00	0.00	0.39	0.34	5.08	13% of 32%	
32	L250	WT05	SW		1.50	5.61	4.2	0.63	device		2.00	0.00	0.39	0.34	8.42	22% of 32%	
33	L250B	WTSO	SE		0.80	0.72	6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.58	2% of 57%	
34	L250A	WTSO	SE		0.80	0.92	6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.74	2% of 57%	
35	L250A	WTLF	SE		1.20	0.72	6.0	0.74	7.906	3.800	0.00	2.60	1.00	1.00	0.86	3% of 57%	
36	L248	WTSE	SE		0.80	0.72	6.0	0.74	7.906	3.800	0.00	3.00	1.00	1.00	0.58	2% of 57%	
37	L248	WTLO	SE		1.20	0.72	6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	0.86	3% of 57%	
38	L247	D01	SE		2.34	0.90	5.8	0.53	7.906	3.800	2.08	1.46	0.73	0.59	2.11	6% of 57%	
39	L247	WT09	SE		2.38	1.20	4.6	0.65	7.906	3.800	2.08	1.42	0.73	0.59	2.86	7% of 57%	
40	L253	D01	NW		2.34	1.84	5.8	0.53	7.906	3.800	2.08	1.46	0.71	0.45	4.31	14% of 23%	
41	L253B	WTLO	NW		1.20	0.72	6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	0.86	4% of 23%	
42	L253B	WTLF	NW		1.20	0.72	6.0	0.74	7.906	3.800	0.00	2.60	1.00	1.00	0.86	11% of 23%	
43	L253A	WTLO	NW		1.20	0.72	6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	0.86	4% of 23%	
44	L247A	WT07	NE		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%	
45	L247B	WT07	NE		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%	
46	L257A	WT08	NE		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.99	0.95	1.99	8% of 93%	
47	L257B	WT08	NE		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.99	0.95	1.99	8% of 93%	
48	L257C	WT08	NE		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.99	0.95	1.99	8% of 93%	
49	L257D	WT08	NE		2.40	0.83	4.6	0.65	1.800	3.800	0.47	1.40	0.99	0.95	1.99	8% of 93%	
50	L256A	WT07	NE		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%	
51	L256B	WT07	NE		1.50	0.90	6.0	0.62	1.800	3.800	0.00	2.30	1.00	1.00	1.35	5% of 93%	
52	L257	D01	NE		2.34	1.84	5.8	0.53	1.800	3.800	0.47	1.46	0.99	0.95	4.31	13% of 93%	
53	L257	D02	NE		2.34	1.84	5.8	0.53	1.800	3.800	0.47	1.46	0.99	0.95	4.31	13% of 93%	
54	L265	WT03	NW		1.50	3.39	4.2	0.63	device		2.00	0.00	0.00	0.21	5.09	10% of 23%	
55	L265	WT02	NW		1.50	2.27	4.2	0.63	device		2.00	0.00	0.00	0.21	3.41	7% of 23%	
56	L266	WT05	NW		1.50	5.61	4.2	0.63	device		2.00	0.00	0.00	0.21	8.42	17% of 23%	

GLAZING ELEMENTS, ORIENTATION SECTOR, SIZE and PERFORMANCE CHARACTERISTICS									SHADING		CALCULATED OUTCOMES OK (if inputs are valid)						
Glazing element			Facing sector		Size			Performance		P&H or device		Shading		Multipliers		Size	Outcomes
ID	Description (optional)	Option A facades	Option B facades	Height (m)	Width (m)	Area (m ²)	Total System U-Value (AFRC)	Total System SHGC (AFRC)	P (m)	H (m)	P/H	G (m)	Heating (S _H)	Cooling (S _C)	Area used (m ²)	Element share of % of allowance used	
57	L263	WT02	NW		1.50	2.27		4.2	0.63	device		2.00	0.00	0.00	0.21	3.41	7% of 23%
58	L263	WT03	NW		1.50	3.39		4.2	0.63	device		2.00	0.00	0.00	0.21	5.09	10% of 23%
59	L264	WT05	NW		1.50	5.61		4.2	0.63	device		2.00	0.00	0.00	0.21	8.42	17% of 23%
60	L266	WTSO	NE		0.80	0.72		6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.58	1% of 93%
61	L266	WTSO	NE		0.80	0.72		6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.58	1% of 93%
62	L266	WTLF	NE		1.20	0.72		6.0	0.74	7.906	3.800	0.00	2.60	1.00	1.00	0.86	4% of 93%
63	L268	WTSF	NE		0.80	0.72		6.0	0.74	7.906	3.800	0.00	3.00	1.00	1.00	0.58	3% of 93%
64	L268	WTLO	NE		1.20	0.92		6.5	0.28	7.906	3.800	0.00	2.60	1.00	1.00	1.10	2% of 93%
65	L269	D01	NE		2.34	0.90		5.8	0.53	7.906	3.800	2.08	1.46	0.66	0.48	2.11	3% of 93%
66	L269	WT09	NE		2.38	1.20		4.6	0.65	7.906	3.800	2.08	1.42	0.66	0.48	2.86	5% of 93%
67	L269A	D01	NE		2.34	1.84		5.8	0.53	7.906	3.800	2.08	1.46	0.66	0.48	4.31	6% of 93%
68	L263A	WTSI	SW		0.80	0.72		6.5	0.28	7.906	3.800	0.00	3.00	1.00	1.00	0.58	2% of 32%
69	L263B	WTLF	SW		1.20	0.90		6.0	0.74	7.906	3.800	0.00	2.60	1.00	1.00	1.08	5% of 32%
70	L261A	WT14	SW		0.60	1.20		4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	3% of 32%
71	L261B	WT14	SW		0.60	1.20		4.6	0.65	7.906	3.800	0.00	3.20	1.00	1.00	0.72	3% of 32%
72	L260A	WT07	SE		1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	5% of 57%
73	L260B	WT07	SE		1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	5% of 57%
74	L270A	WT08	SE		2.40	0.83		4.6	0.62				0.00	1.00	1.00	1.99	6% of 57%
75	L270B	WT08	SE		2.40	0.83		4.6	0.62				0.00	1.00	1.00	1.99	6% of 57%
76	L270C	WT08	SE		2.40	0.83		4.6	0.62				0.00	1.00	1.00	1.99	6% of 57%
77	L270D	WT08	SE		2.40	0.83		4.6	0.62				0.00	1.00	1.00	1.99	6% of 57%
78	L269A	WT07	SE		1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	5% of 57%
79	L269B	WT07	SE		1.50	0.90		6.0	0.62				0.00	1.00	1.00	1.35	5% of 57%
80	L270	D01,D02	SE		2.34	3.68		5.8	0.53				0.00	1.00	1.00	8.61	30% of 57%

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if inputs are valid



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